KOVALEV, Ye.Ye.; OSANOV, D.P.

The amount of radiation amanating from a hollow cylindrical source filled with an absorbing substance. Biofizika 5 no. 5:630-633 '60. (MIRA 13:10)

(RADIATION—DOSAGE)

S/089/60/008/04/09/009
B113/B017

AUTHORS: Osanov, D. P., Kovalev, Ye. Ye.

TITLE: Radiation of a Cylindrical Source Behind a Plane Shield

PERIODICAL: Atomnaya energiya, 1960, Vol. 8, No. 4, pp. 374-376

TEXT: The traditional description of radiation absorption of a cylindrical source is not satisfactory. A better solution of the problem of gamma radiation absorption is obtained by using the formula for the dose rate $P = 2P_\gamma qR\, S(p,k,\mu_1 R,\mu_2 d)\, B(\mu_2 l)$ where P_γ is a constant, q the specific activity, z,R,k,p the geometrical dimensions of the cylinder, μ_1 is the coefficient of radiation absorption in the source, μ_2 that of the protective shield, B the dosage build-up factor for a point source. The integral S was computed by means of the electronic computer "Strela". The values of the integral S at $\mu_1 R = 1$ for $p = 1.5 \div 5$, $\mu_2 d = 0.5 \div 10$ and $k = 0.5$ and 1.0 are given in the table. In Fig. 2 the computed and experimental attenuation factors are compared as functions of $\mu_2 d$ of

Card 1/2

GUSEV, N.G.; KOVALEV, Ye.Ye.; OSANOV, D.P.; POPOV, V.I.; MARGULIS, U.Ya., nauchnyy red.; KOKOSOV, L.V., red.; VLASOVA, N.A., tekhn. red.

[Shielding against radiation from extended sources] Zashchita ot izlucheniia protiazhennykh istochnikov. Moskva, Gos.izd-vo lit-ry v oblasti atomnoi nauki i tekhniki, 1961. 287 p. (MIRA 15:2)
(Shielding (Radiation))

POPOV, V.I.; SMIRENNYY, L.N.; KOVALEV, Ye.Ye.

Integral dose absorbed by a cylindircal object from a hollow cylindrical emitter. Radiobiologiia 1 no.5:807-812 '61. (MIRA 14:11)

(RADIATION--DOSAGE)

KOVALEV, Ye.Ye.; OSANOV, D.P.

Emission from a volume source in the presence of surface activity.
Atom.energ. 10 no.5:515-517 My '61. (MIRA 14:5)
(Gamma rays)

45444

S/892/62/000/001/006/022
B102/B186

AUTHORS: Osanov, D. P., Kovalev, Ye. Ye.

TITLE: Determination of the build-up factors of the scattered radiation of extended sources

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izluchenij, no. 1, 1962, 53-54

TEXT: A method is proposed for calculating the build-up factors of the radiation scattered in the shield of an arbitrary extended source. It is simpler than the usual point-source integration method and applicable if the dependence of the attenuation multiplicity on the shield thickness μx is known. It is based on the determination of the equivalent absorption length μl defined by the condition $K_{es}(\mu x) = K_{ps}(\mu l) = e^{\mu l}$; es and ps refer to extended source and point source, $l > x$. The build-up factor is then determined by $B_{es} = B_{ps}(\mu l) = B_{ps}(\ln K_{es})$. Since self-absorption has little effect, and only the angle of incidence of the radiation on the shield is of importance, this method yields good results.

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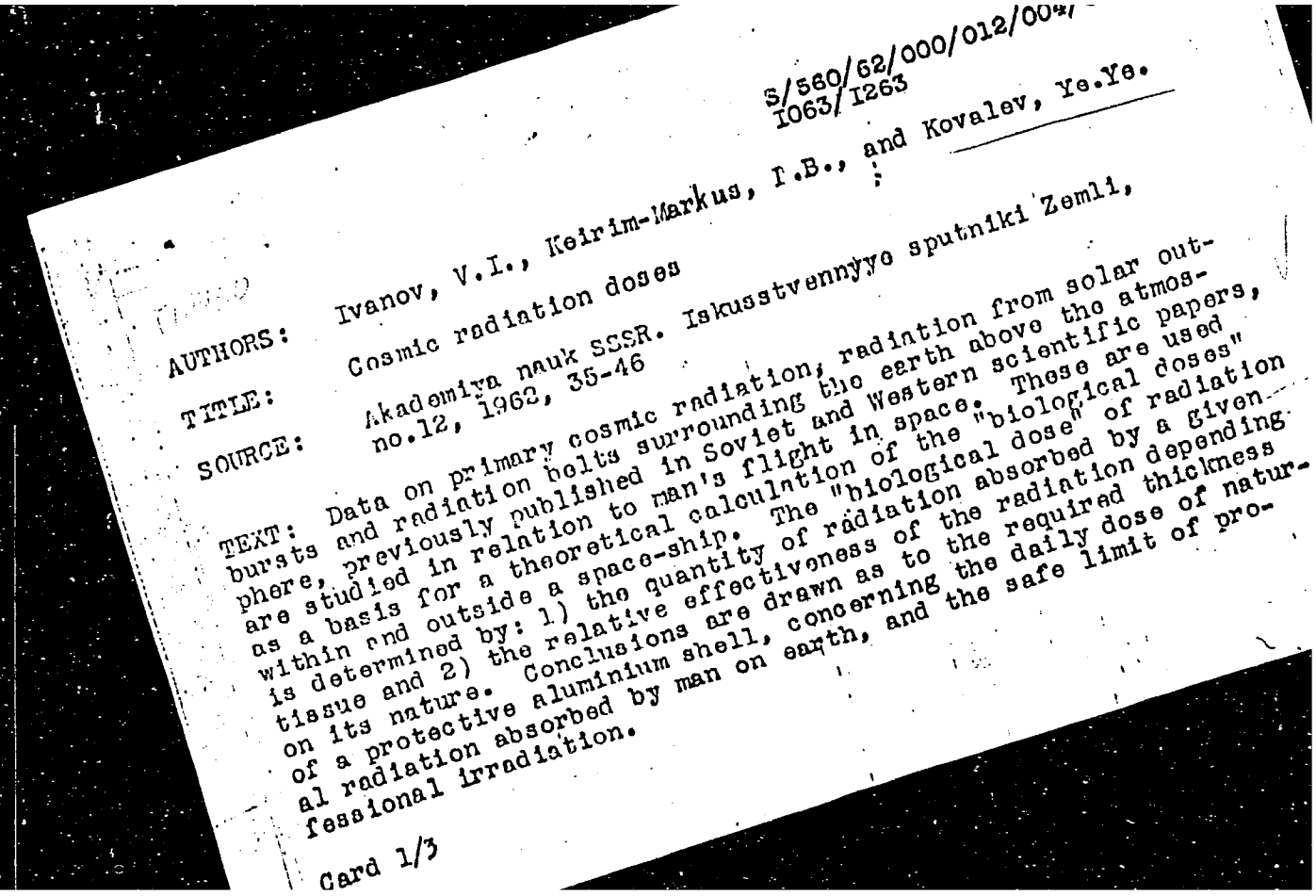
in practical calculations of complex shield configurations. It was experimentally checked by Osanov and Kovalev (Atomnaya energiya, 6, no.4, 374,1960).



S/560/62/000/012/00*/
I063/ I263

AUTHORS: Ivanov, V.I., Keirim-Markus, I.B., and Kovalev, Ye.Ye.

TITLE: Cosmic radiation doses

SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli, no.12, 1962, 35-46

TEXT: Data on primary cosmic radiation, radiation from solar outbursts and radiation belts surrounding the earth above the atmosphere, previously published in Soviet and Western scientific papers, are studied in relation to man's flight in space. These are used as a basis for a theoretical calculation of the "biological doses" within and outside a space-ship. The "biological dose" of radiation is determined by: 1) the quantity of radiation absorbed by a given tissue and 2) the relative effectiveness of the radiation depending on its nature. Conclusions are drawn as to the required thickness of a protective aluminium shell, concerning the daily dose of natural radiation absorbed by man on earth, and the safe limit of professional irradiation.

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S/560/62/000/012/004/014
I063/I263

Cosmic radiation doses

The "biological dose" of each component of the primary cosmic radiation is calculated on the basis of data on the linear density of energy loss of this radiation in NaI (Vernov, S.N., Chudakov, A.Ye. et al., Rep. Akademiya nauk SSSR, 125, 304, 1959.)
The power of the penetrating radiation of solar outbursts is calculated according to the formula:

$$P_{ion} = 1.60 \times 10^{-8} \cdot 3600 \int_{R_1}^{\infty} \Phi\,(R + R_1)\, S\,(R)\,dR\,(\mathrm{rad/hour^{-1}}),$$

where P_{ion} = power of the absorption dose connected with ionization losses of protons, $\Phi\,(R)dR$ = proton flux with path from R to R+dR ($\mathrm{in \cdot g \cdot cm^{-2}}$), S(R) = ionization loss of protons with path R, R_1 = thickness of the absorber.
Assuming an exponential function for the energetic spectrum of protons and using an approximate relation between E and R, the maximal biological doses absorbed by an organism within a space-ship are determined for different thicknesses of the protective shell. A similar formula is used for the power of the internal radiation belt

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S/560/62/000/012/004/014
I063/I263

Cosmic radiation doses

surrounding the earth. Here the doses are calculated also outside the space-ship where electrons and low-energy protons must be taken into account.

A protective shell of 1 g.cm.$^{-2}$ aluminium is sufficient against the electrons of the external radiation belt, but a Bremsstrahlung is produced at the walls of the ship. Its intensity in the center of a container is calculated theoretically and the results are compared with direct measurements performed by means of a scintillator in the first Soviet rocket (Vernov, S.N., Chudakov, A.Ye., U.F.N. 70, 585, 1960). A satisfactory agreement is obtained if the energies of the high-energy electrons in the external radiation belt are more than 2 MeV. There are 2 tables. The most important English language references are:

J.A. Van Allen, L.A. Frank, Nature, 183, 430, 1959.
J.A. Van Allen, L.A. Frank, Nature, 184, 219, 1959.
D.D. Kerlee, O.K. Krienke, Phys.Rev. 115, 137, 1959.
E.P. Ney, J.R. Winckler, P.S. Freier, Phys.Rev.Lett. 3, 183, 1959.

SUBMITTED: May 30, 1961
Card 3/3

S/560/62/000/012/005/014
I063/I263

AUTHORS: Keirim-Markus, I.B., Kovalev, Ye.Ye., and Uspenskiy, L.N.

TITLE: Measurements of the radiation doses in the second, fourth and fifth cosmic ship satellites

SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli, no.12, Moscow, 1962, 47-50

TEXT: The orbits of these ship satellites passed below the earth's radiation belts, at a distance of 180 to 340 km. from its surface. The only sources of penetrating radiation were therefore: 1) the primary cosmic radiation; 2) the radiation of the solar outbursts. The integral radiation doses were measured with luminescent dosemeters (I.P.Belov, K.C.Kalugin, J.B.Keirim-Marcus et al., Pribory i tekhnika eksperimenta, no.4, 74, 1959), photodosemeters (J.B.Keirim-Markus, A.P.Pesotskaya, Sbornik radiometricheskikh i dozimetricheskikh metodik, Medgiz, 1959, p.311) and others. A component analysis of the radiation was performed by means of lead and aluminium filters. A mean daily dose of 6-10 m rad was recorded. This result is

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S/560/62/000/012/005/014
I063/I263

Measurements of the radiation doses...

in full accordance with the calculated value of the primary cosmic radiation (V.I.Ivanov, I.B.Keirim-Markus, Ye.Ye.Kovalev, Iskusstvennyye sputniki Zemli, no.12, p.35). No solar outburst radiation was observed, but a Bremsstrahlung of about 1000 keV was registered in the second ship, apparently due to a flight within the external radiation belt of the earth. There is 1 table.

SUBMITTED: May 27, 1961

Card 2/2

KOVALEV, Ye. Ye.; POPOV, V. I.; SMIRENNYY, L. N.

Distribution of absorbed doses produced by a hollow cylindric irradiator. Radiobiologiia 2 no.3:502-507 '62. (MIRA 15:7)

(RADIATION—DOSAGE) (GAMMA RAYS)

S/089/62/012/006/013/019
B102/B104

26.2240

AUTHORS: Osanov, D. P., Kovalev, Ye. Ye.

TITLE: Absorption dose factor for a cylindrical source in the presence of a shield

PERIODICAL: Atomnaya energiya, v. 12, no. 6, 1962, 528

TEXT: The results of previous work (Atomnaya energiya, 10, no. 5, 515, 1961)* are extended to a cylindrical source located behind a plane shield with a thickness of $\mu_1 d$. Using the denotations from the previous work, the absorption dose factor is obtained as

$$S = 1 + \frac{1 + 0.75\,\mu R}{2}(1.5 + 1/p)f(\mu_1 d)\varepsilon.$$

The function $f(\mu_1 d)$ is tabulated for $\mu R = 1, 3, 5, 7, 10$, $p = 1.5, 2, 3, 5, 10$, and $\mu_1 d = 0, 1, 3, 5, 7, 10$. It is virtually independent of the relative height of the cylinder. The relation obtained for S is valid for single scattering of radiation. Multiple scattering can be taken into account by using the method of equivalent absorption length. The factor $B(\mu_1 l)/B(\mu_1 t)$ has to be introduced,

Card 1/2 * Not abstracted

S/089/62/012/006/013/019
B102/B104

Absorption dose factor for ...

where B is the dose accumulation factor, and $\mu_1 l$ and $\mu_1 t$ are the equivalent absorption lengths for a hollow and a solid cylinder, respectively. There is 1 table.

SUBMITTED: November 25, 1961

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38992
S/089/62/013/001/008/012
B102/B104

21.5250

AUTHORS: Kovalev, Ye. Ye., Osanov, D. P.

TITLE: The volume radiation of a gas-filled source behind a plane shield

PERIODICAL: Atomnaya energiya, v. 13, no. 1, 1962, 68 - 70

TEXT: The attenuation factor of the gamma radiation emitted by a cylindrical gas-filled source was calculated under the assumption that the self-absorption in the source could be neglected. The calculations were made using the formulas $P=2P_{\gamma}qRS(p, k, \mu_1 R, \mu_2 d)\,B(\mu_2 l)$ (1) for the dose rate in the source plane behind the shield, $K=\frac{S(p, k, \mu_1 R, \mu_2 d=0)}{S(p, k, \mu_1 R, \mu_2 d)\,B(\mu_2 l)}=\frac{K'(p, k, \mu_2 d)}{B(\mu_2 l)}$, (2) for the attenuation factor in the shield, and

$$K'(p, k, \mu_2 d)=Ae^{1,035\mu_2 d}+(1-A)e^{0,85\mu_2 d}. \quad (3)$$

as an approximate relation holding for the attenuation factor K' if multiple scattering in the shield is neglected. B is the build-up factor of the scattered radiation for a point source; $\mu_2 = \ln K'$. The remaining

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The volume radiation ...

definitions are given in "Atomnaya energiya", v. 8, no. 4, 374, 1961. The coefficient A, which depends only on source parameters, is tabulated. The accuracy of Eq.(3) is 10-15%. There is 1 table.

SUBMITTED: December 18, 1961

Card 2/2

BORKOV, V.G.; DEMIN, V.P.; KEIRIM-MARKUS, I.B.; KOVALEV, Ye.Ye.; LARICHEV, A.V.; SAKOVICH, V.A.; SMIRENNYY, I.N.; SYCHKOV, M.A.; MEL'NIKOVA, A.I., red.

[Radiation safety in space flights] Radiatsionnaia bezopasnost' pri kosmicheskikh poletakh. Moskva, Atomizdat, 1964. 370 p. (MIRA 18:1)

ACCESSION NR: AT4021257 S/2892/63/000/002/0100/0108

AUTHOR: Kovalev, Ye. Ye.; Larichev, A. V.

TITLE: The problem of protection against electrons and bremsstrahlung from the outer radiation belt of the Earth

SOURCE: Moscow. Inzh.-fiz. Institut. Voprosy* dozimetrii i zashchity* ot izlucheniy (Problems of dosimetry and radiation protection), no. 2, 1963, 100-108

TOPIC TAGS: radiation belt, cosmic radiation, radiation protection, beta ray, bremsstrahlung, space flight, electron stream

ABSTRACT: The authors note that in recent times information on full electron streams and spectrum in the Earth's outer radiation belt has undergone considerable modification. It has been found that previous estimates of the full electron streams in the outer radiation belt, based on radiation-counter tests, were approximately 1,000 times too high. The purpose of the present article is to review problems of protection against the electrons and bremsstrahlung of the outer radiation belt in the light of the new information available with respect to the streams and the spectrum of the electrons. The authors consider the radiation hazard to the astronaut (and, concomitantly, the shielding requirements of the capsule) in terms of the new data and analyze the contribution of the electrons

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ACCESSION NR: AT4021257

and the bremsstrahlung, respectively, to the over-all dose past the shielding. A model is proposed for this purpose, based on several simplifying assumptions (an isotropic spherical source of bremsstrahlung), and an equation is written for the intensity of the dose in the center of the cabin. Tables are given, showing the relative contributions of various spectral components of the bremsstrahlung and other parameters as well. It is established that the greatest contributions to the dose intensity of outer belt electron bremsstrahlung are made by electrons with energies of 0.05-0.3 Mev. The data presented refer to a space-capsule wall constructed of a material with thickness $d = 0.1\text{-}10$ g/cm^2 and atomic number Z (in the particular case of carbon $Z = 6$, but the data may easily be extrapolated to other light substances by multiplying the values given by $Z_{eff}/6$). In the second section of the article, the estimates derived for the bremsstrahlung doses are supplemented by a calculation of the doses of penetrating electrons of the outer belt. The author establishes the fact that the intensity of the electron dose decays very rapidly as the thickness of the shielding increases. With a shielding thickness of $d \leq 1.0$ g/cm^2, by far the greatest part of the dose is due to electrons which penetrate through the shielding; at $d > 1 - 2$ g/cm^2, the dose is determined entirely by bremsstrahlung. In conclusion, the authors offer certain practical considerations with respect to radiation protection in the outer belt, emphasizing two fundamental requirements: 1) for reduced bremsstrahlung generation, the shielding must be manufactured of a material with a low atomic number;

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ACCESSION NR: AT4021257

2) for increased bremsstrahlung absorption, the shielding must be manufactured of a material with a high atomic number. The authors note that these conditions are satisfied by a combined shielding, consisting, for example, of a layer of low-Z material (outer layer) and a layer of high-Z material (inner layer). Orig. art. has: 7 formulas and 7 tables.

ASSOCIATION: INZH.-FIZ. INSTITUT, MOSCOW (Engineering Physics Institute)

SUBMITTED: 00 DATE ACQ. 06Apr64 ENCL: 00

SUB CODE: SV, LS NO REF SOV: 009 OTHER: 003

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L 19447-63 EWT(l)/EWP(q)/EWT(m)/FCC(w)/FS(v)-2/FCS/BDS/ES(a)/ES(j)/ES(c)/ ES(k)/ES(s)-2/ES(t)-2/ES(v)/EEC-2 AEDC/AFFTC/ASD/AFMDC/ESD-3/APGC/SSD Pb-4/ Pi-4/Pt-4/Po-4/Pe-4/Pq-4 TT/A/WH/AR/RD/K/DD

ACCESSION NR: AT3006866 S/2560/63/000/015/0102/0103

AUTHOR: Keirim-Markus, I. B.; Kovalev, Ye. Ye.; Sergeyeva, N. A.; Uspenskiy, L. N.

TITLE: Measurement of doses of radiation received by Yu. A. Gagarin and G. S. Titov during the first space flights

SOURCE: AN SSSR. Iskusst. sputniki Zemli, no. 15, 1963, 102-103

TOPIC TAGS: radiation dosimeter, ILK dosimeter, IFKN photodosimeter, proton, neutron, Gamma radiation, thermoluminescent glass

ABSTRACT: Cosmonauts Gagarin and Titov carried ILK luminescent dosimeters in the breast pockets of their oversuits. Each cosmonaut carried three dosimeters with 3.2-mm Al filters, three with 1.3-mm Pb filters, and one without a filter. The dosimeter readings for Gagarin were: 2.9, 2.4, and 1.3 mrad for Al filters; 0.8, 2.2, and 3.0 mrad for Pb filters; and 1.6 mrad without a filter. The readings for Titov were: 12.0, 12.4, and 15.0 mrad for Al filters; 8.0, 10.0, and 8.0 mrad for Pb filters; and 12.0 mrad without a filter. Control dosimeters on the ground registered 0.5—0.6 mrad per diem.

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The two cosmonauts also carried IFKN photodosimeters for the detection of neutron and γ-radiation in special pockets located on the belt of the inner suit. In addition, Titov carried a thermoluminescent glass for the registration of γ-rays and high-energy protons (from 0.1 to 10^6 rad) in a breast pocket. Bremsstrahlung with an energy of 10^5 ev was recorded for Titov. The dose of primary cosmic radiation for the two cosmonauts was 0.4—0.6 mrad per orbit. The similarity of results in the two flights indicates that primarily cosmic radiation was received and that solar flares had little effect. Assuming the RBE to be 7, the absorbed dose received by Titov did not exceed 60 mber. Orig. art. has: 1 table.

ASSOCIATION: none

SUBMITTED: 14Jul62 DATE ACQ: 29Jul63 ENCL: 00

SUB CODE: AM NO REF SOV: 007 OTHER: 001

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Card 1/2

ACCESSION NR: AP4036528 S/0089/64/016/005/0437/0440

AUTHOR: Afanas'yev, V. P.; Kyeirim-Markus, I. B.; Kovalev, Ye. Ye.; Sakovich, V. A.; Smirenny*y, L. N.; Sy*chkov, M. A.

TITLE: Methods for experimental studies of the protecting properties of materials by using the proton beam of the Dubna synchrocyclotron

SOURCE: Atomnaya energiya, v. 16, no. 5, 1964, 437-440

TOPIC TAGS: space flight, irradiation protection, high energy proton, secondary neutron, proton absorption, cosmonaut protection

ABSTRACT: In connection with the problem of protecting cosmonauts from penetrating radiation during spaceflights the absorption of protons from the Dubna synchrocyclotron of 660 ± 3 Mev was investigated. In the space problem, one has to consider a wide beam of protons, whereas experimentally one deals with narrow beams. The authors show that by proper distribution of radiation detectors and by summation of their readings, the problem is equivalent to recording by a single detector of radiation produced by a wide proton beam. The proton energy

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ACCESSION NR: AP4036528

behind the shielding was measured by magnetic analysis and by the energy-range relationship in lead and aluminum. Orig. art. has: 1 figure.

ASSOCIATION: None

SUBMITTED: 28Mar63 ATD PRESS: 3056 ENCL: 00

SUB CODE: PH, NP NO REF SOV: 004 OTHER: 004

Card 2/2

Kovalev, Ye. Ye.; Osanov, D. P.; Radziyevskiy, G. B.; Mel'nik, A. D.

ORG: none

TITLE: Protection of the cosmonaut from electrons and bremsstrahlung radiation in the earth's radiation belt

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 5, 1965, 782-788

TOPIC TAGS: radiation protection, manned space flight, radiation biologic effect, electron, bremsstrahlung, absorbed dose, tissue dose, radiation dosimetry

ABSTRACT: The authors consider methodological problems in calculating the protection of cosmonauts from electron and bremsstrahlung irradiation in the earth's radiation belt. Among these problems is the selection of criteria for evaluating the radiation hazard and geometrical peculiarities of protective structures. A calculation is proposed for the protection of a cosmonaut situated outside a spacecraft in a radiation belt. Experimental data on the depth distribution of electron doses in materials of low atomic number are used in this calculation. The possibility of using a single dose distribution for electrons in an energy interval up to 3 Mev is demonstrated. Also presented are evaluations of bremsstrahlung tissue doses emittable by electrons in a protective layer. Orig. art. has: 4 figures.

[CD]

UDC: 628.58:629.198.621

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L 1444-66 EWT(m)/EPF(c)/ETC/EPF(n)-2/EWG(m)/EWP(j)/EWA(h)/EWA(l) RM

ACCESSION NR: AT5023157 UR/2892/65/000/004/0102/0116

AUTHOR: Afanas'yev, V. P.; Biskupchuk, A. M.; Dudkin, V. Ye.; Kovalev, Ye. Ye.; Kuznetsov, V. G.; Litvinova, E. G.; Smirennyy, L. N.

TITLE: Experimental data on the shielding properties of materials with regard to high energy protons

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 4, 1965, 102-116

TOPIC TAGS: radiation shielding, proton beam, polyethylene, lead, aluminum, radiation dosimetry

ABSTRACT: Experiments on shielding against high-energy protons were conducted on the OIYaI synchrocyclotron in Dubno. The total absorbed tissue dose $Q(\delta)$ was measured in a thin layer of a detector placed parallel to the shielding plane. The dose attenuation and accumulation factor was determined from measurements of $Q(\delta)$ beyond a shielding screen of thickness δ:

$$f(\delta, E_0) = \frac{Q(\delta)}{Q(0)},$$

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ACCESSION NR: AT5023157

In all cases, the values of $Q(\delta)$ were normalized in conformity with the monitor readings. The experimental set-up is shown in fig. 1 of the Enclosure. The proton beam from absorber *1* passes through collimator *2* and is deflected by magnet *3* to collimator *4*, thus producing a highly pure monochromatic beam of energy. The beam then passes through collimator *5* and ionization chamber *M*, and impinges directly (normal to the surface) on a layer of shielding material immediately adjacent to detector *D*. The detector was a flat ten-channel ionization chamber filled with a gas mixture (35% He + 65% Ar) which is capable of measuring the dose in tissue rads for energies of 1—660 Mev. The dimensions of the chamber were 500 × 300 mm. The characteristics of the materials used in the experiments are shown in table 1 of the Enclosure. Curves are given for the dose accumulation and attenuation factor for a wide beam of protons as a function of shield thickness for various materials at various beam energies. The curves show good agreement with theoretical calculations. Curves are also given for the mean tissue dose in a flat phantom as a function of the incident energy of protons in the absence of a shield. The curves agree quite well with theoretical calculations. The mean tissue dose $\overline{D}_t$ for a flat phantom with $\delta_{ph} = 30$ g/cm^2 is found behind a polyethylene shield at proton incident energies of 126, 260, 415 and 660 Mev. The maximum mean tissue dose for a thickness of 20 g/cm^2 is at a proton energy of 260 Mev, while at greater

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ACCESSION NR: AT5023157

(7)

thicknesses, the maximum comes at 415 Mev. The mean tissue dose for 415-Mev protons remains practically unchanged up to a thickness of 50-60 g/cm^2 of polyethylene. The 660-Mev proton dose is reduced beyond this thickness by a factor of only 2, while the dose is practically zero at a thickness of 15 g/cm^2 for 126 Mev, and the same is true at a thickness of ~40 g/cm^2 for 260-Mev protons. The attenuation curves for the various materials are practically identical. Thus an equivalent thickness of any of the materials studied may be substituted at proton energies of 126 and 260 Mev for a polyethylene shield. On this basis, curves are given for mean tissue dose as a function of shielding thickness for various materials at energies of 126 and 260 Mev. It is found that for a proton energy of 260 Mev, consideration must be given to beam attenuation through inelastic interaction in the shielding materials and in biological tissue. The method used in this investigation has not been verified for proton energies greater than 260 Mev and less than 126 Mev. Orig. art. has: 12 figures, 1 table. [14]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 02 SUB CODE: NP

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ACCESSION NR: AT5023157

ENCLOSURE: 01

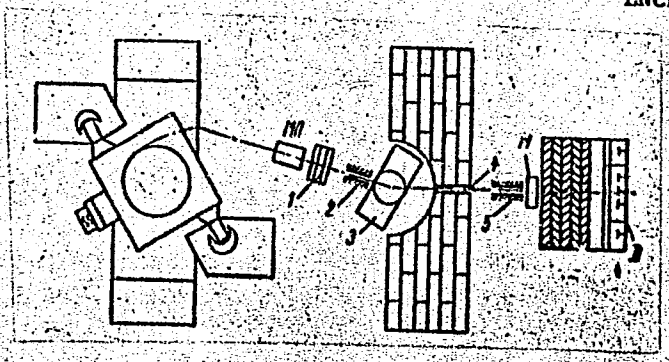

Fig. 1. Experimental setup

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ENCLOSURE: 02

TABLE 1

Material	Chemical formula	Density g/cm^3	Content of elements, wt. %
Polyethylene.....	$(CH_2)_N$	0.94	C=85, 6; H = 14.4
Aluminum.....	Al	2.7	Al $\approx$ 100
Mixture of polyethylene and titanium hydride..	$(CH_2)_n$ + $TiH_{1.65}$	2.7	$(CH_2)_n \approx 13.5$; $TiH_{1.65} \approx 86.5$
Lead.....	Pb	11.3	Pb $\approx$ 100
Mixture of polyethylene and lead.....	$(CH_2)_n$ + Pb	1.17 1.67 2.7	$(CH_2)_n$ = 75; Pb=25 $(CH_2)_n$ = 50; Pb-50 $(CH_2)_n$ = 26; Pb-74

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L 27302-66 EWI(1)/EWT(m)/FCC/EWA(h) GW

ACC NR: AM6001040 Monograph UR/

Bobkov, V. G.; Demin, V. P.; Keirim-Markus, I. B.; Kovalev, YE. YE.; Larichev, A. V.; Sakovich, V. A.; Smirennyy, L. N.; Sychkov, M. S.

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Radiation safety during space flights (Radiatsionnaya bezopastnost' pri kosmicheskikh poletakh) Moscow, Atmizdat, 1964. 370 p. illus., biblio. 1700 copies printed. B+/

TOPIC TAGS: cosmic radiation, solar radiation, space radiation hazard, radiation safety, radiation belt, radiation dosimetry, radiation protection, solar corpuscular radiation, nuclear energy, nuclear propulsion engine

PURPOSE AND COVERAGE: This monograph may be of interest to persons concerned with problems of radiation safety in space flights. It is a compilation of articles written by various authors on cosmic radiation, its sources, levels, dosimetry techniques, and physical methods for protection against radiation. The authors' purpose was to present the problem of radiation safety in space flight as fully as possible. Peculiarities of cosmic radiation dosimetry are outlined; radiation conditions in space, basic interactions of cosmic radiation with the matter, and radiation protection are analyzed. Chapters 1 and 3 were written by Z. B. Keirim-Markus, Chapters 2 and 4 by M. A. Sychkov, Chapters 5 and 8 by A. V. Larychev, Chapter 6 by Ye. Ye. Kovalev, Chapter 7 by Ye. Ye. Kovalev and L. N. Smirennyy, Chapter 9 by V. G. Bobkov, and Chapter 10 by V. P. Demin and V. A. Sakovich.

TABLE OF CONTENTS [abridged]:

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ACC NR: AM6001040

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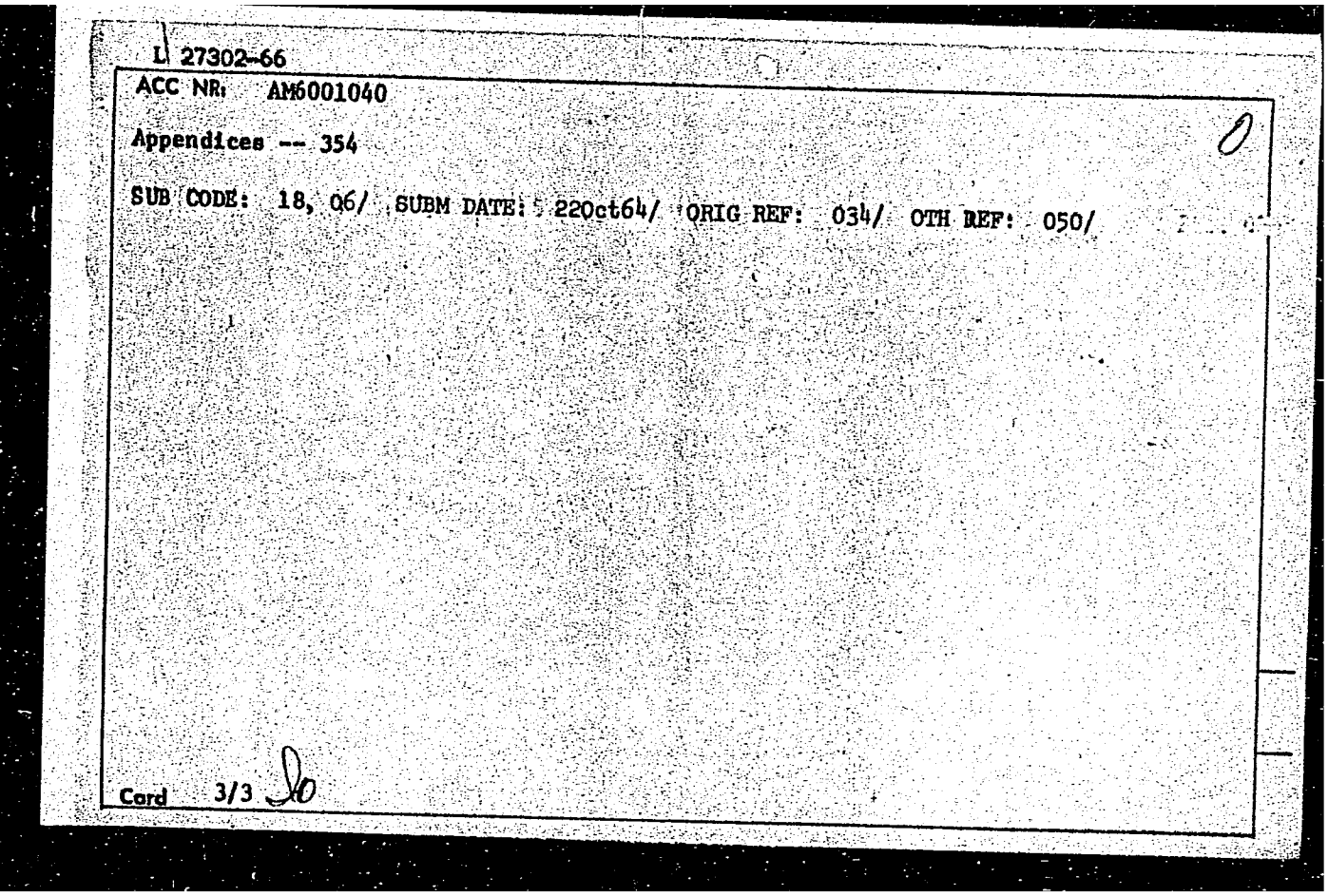

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ACC NR: AM6001040

Appendices -- 354

SUB CODE: 18, 06/ SUBM DATE: 220ct64/ ORIG REF: 034/ OTH REF: 050/

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L 09274-67 FSS-2/EWT(l)/EWT(m)/...

ACC NR: AT6036470 SOURCE CODE: UR/0000/66/000/000/0015/0016

AUTHOR: Akatov, Yu. A.; Kovalev, Ye. Ye.; Petrov, V. M.; Skvortsov, S. S.; Smirennyy, L. N.

ORG: none

TITLE: Analysis of the results of measurements of cosmic-radiation doses in circumterrestrial space [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24-27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 15-16

TOPIC TAGS: radiation dosimetry, cosmic radiation, solar flare, thermoluminescent dosimeter, radiation shielding, manned spaceflight, photodosimeter, ILK dosimeter

ABSTRACT:

The results of measurements of radiation in space taken at altitudes of 200—400 km have been analyzed. Dosimetry was performed by means

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APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000825610011-7"

of thermoluminescent integral dosimeters, ILK plates, and photodosimeters. The composition of radiation was studied using a set of nuclear photoemulsions. Dose measurement and study of the composition of radiation was performed behind polyethylene shielding of varying thickness. In addition, some of the thermoluminescent dosimeters were located behind lead, tin, and cadmium filters.

Polyethylene shielding blocks were spherical, with wall thicknesses of 5, 10, and 15 cm. Sets of dosimeters and photoemulsions were placed inside the shielding blocks as well as outside of them at four different points inside the cabin of the satellite.

The experiments established that the average cosmic-radiation dose amounted to between 16 and 20 mrad/diem. It was found that the thickness of shielding and the filters did not have a significant effect on the size of the dose. The doses obtained are in general agreement with doses obtained earlier on the Vostok spaceships.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000825610011-7"

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The consistency of the doses obtained during the 1961—1965 period can be explained by the fact that on the trajectories in question the magnetic field of the Earth shields practically all of the low-energy spectrum of galactic radiation. Consequently, the main part of the dose was composed of high-energy particles whose intensity does not depend on solar activity to any great degree. This fact also explains the small changes in dose behind various thicknesses of shielding. [W.A. No. 22; ATD Report 66-116]

SUB CODE: 22,18,06 / SUBM DATE: 00May66

Card 3/3 vmb

ACC NR: AT6036521 SOURCE CODE: UR/0000/66/000/000/0099/0100

AUTHOR: Vildrov, A. I.; Dudkin, V. Ye.; Kovalev, Ye. Ye.; Kuznetsov, V. G.; Smirennyy, L. N.

ORG: none

TITLE: Evaluation of radiation hazard during a flight to the moon [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966.]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 99-100

TOPIC TAGS: lunar spaceflight, cosmic radiation biologic effect, radiation dosimetry, radiation protection, solar flare, radiation permissible dose

ABSTRACT: During lunar flight and lunar landing cosmonauts will be exposed to the Earth's radiation belts, galactic space radiation, corpuscular radiation from solar flares, and lunar radiation itself. It has been calculated that during passage through the Earth's radiation belts, which will take approximately 30 min, the mean tissue dose will not exceed 3—5 rem. On the 30-day lunar flight the dose from galactic space radiation will amount to approximately 4—8 rem. Solar flares represent the greatest radiation

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ACC NR: AT6036521

hazard for lunar flight. With shielding of ~1 g/cm^2 the surface dose can reach ~10^4 rem from a high-intensity flare. If the cosmonaut stays in a radiation shelter during a solar flare, the obtained dose can be lowered to 50 rem or less. The probability of an intense solar flare during a period of maximum solar activity is around 10% (for a 30-day period). Doses from galactic space radiation and corpuscular radiation are determining factors on the lunar surface. The contribution to the total dose from natural and induced radiation is no more than several percent. However, doses from galactic space radiation and corpuscular radiation on the lunar surface are two times less than in space, due to shielding by the Moon itself.
[W. A. No. 22; ATD Report 66-116]

SUB CODE: 06, 18, 22 / SUBM DATE: 00May66

Card 2/2

ACC NR: AT6036542 SOURCE CODE: UR/0000/66/000/000/0137/0138

AUTHOR: Grigor'yev, Yu. G.; Kovalev, Ye. Ye.

ORG: none

TITLE: Spaceflight radiation hazards [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 137-138

TOPIC TAGS: radiation protection, radiation dosimetry, solar flare, cosmic radiation, biologic effect, proton radiation biologic effect, radiation shielding, space pharmacology

ABSTRACT: Cosmic radiation is made up of galactic cosmic radiation, radiation from the Earth's radiation belts and from other planets, and corpuscular radiation from solar flares. Doses from galactic cosmic radiation in interplanetary space can reach 190—250 rem/day, an obviously serious hazard both for cosmonauts and for the life-support system on a spacecraft. Mean tissue doses from protons in the inner radiation belt can amount to 0.16 rem/day with an orbit of 500 km (orbital inclination 65°). However, electrons in the outer radiation belt have a low penetrating capacity and act chiefly on the skin. Corpuscular radiation from solar flares consists mostly of alpha particles and protons, the latter with energies ranging from several Mev to dozens of bev. This wide range of proton energy produces

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Card 2/2

L 10959-67 EWT(1)/EWT(m) SCTB DD/GD

ACC NR: AT6036577 SOURCE CODE: UR/0000/66/000/000/0197/0197

AUTHOR: Karpov, O. N.; Kovalev, Ye. Ye.; Nevskaya, G. F.; Smirennyy, L. N. 34

ORG: none

TITLE: Problems of designing local radioprotective shielding for cosmonauts [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 197

TOPIC TAGS: radiation shielding, cosmonaut radiation shielding, radiation protection, solar flare, spacecraft shielding

ABSTRACT: Economy of weight in spacecraft shielding is best achieved by placing the shielding as close as possible to the cosmonaut. Local shielding is designed taking into account the varying radiosensitivity of different body organs and the considerable unevenness of the radiation field inside the spacecraft cabin. Calculation of local shielding is based on determination of the effectiveness of shielding of an organ by parts of the ship and by other parts of the body. A model of a so-called standard man (with typical

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L 10959-67

ACC NR: AT6036577 O

placement of organs) was used to facilitate dose calculations for individual vital organs. Spatial distributions of tissue thicknesses with respect to the vital organs were determined using this model. On the basis of data obtained, calculations were made of doses from a solar flare for various critical organs, assuming a hypothetical spacecraft hull. Calculations utilized dependences of dose on tissue depth for given shielding thicknesses. Results of these calculations show the definite possibility of weight economy with the use of local shielding. [W.A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 2/2 bp

L 10065-67 EWT(l)/EWT(m) SCTB DD/GD

ACC NR: AT6036583 SOURCE CODE: UR/0000/66/000/000/0207/0208

AUTHOR: Kovalev, Ye. Ye.; Popov, V. I.; Sychkov, M. A. //

ORG: none

TITLE: Basic problems of modeling the effect of the radiations of space on biological objects [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 207-208

TOPIC TAGS: cosmic radiation biologic effect, proton radiation biologic effect, biologic model, cosmic radiation

ABSTRACT: There are two main components of cosmic radiation: primary cosmic radiation, which has a chronic effect on the cosmonaut during the entire flight, and solar cosmic radiation (corpuscular radiation from solar flares), which has an acute, periodic effect varying with the character and intensity of the flares. Primary cosmic radiation consists of protons, alpha particles and multicharge ions, many of which lie in the energy range of 0.5—1.0 bev/nucleon. However, the maximum energy of these particles reaches 10^9 bev. The proton constituent of cosmic radiation can be partially repro-

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L 10965-67
ACC NR: AT6036583

duced as a narrow beam on an accelerator. However, multicharge ions of these energies cannot be so reproduced. Thus the problem arises of modeling radiation effects applicable to concrete flight conditions.

Time parameters and the magnitude of the cosmic radiation effect are modeled using gamma rays. In this manner equality of depth distributions of the absorbed dose in irradiated objects is maintained. Specially developed gamma irradiators permit considerable variations in the level and time of acute irradiation (on a background of chronic irradiation) of groups of large laboratory animals. An OIYAI synchrocyclotron, creating a flux in a wide energy range down to 50 Mev, was used to model the radiation effect of solar flare protons. On long spaceflights the chief hazard will be multicharge ions of primary cosmic radiation. In order to model the radiation effect of these heavy charged particles, an apparatus was created which irradiates cell and tissue cultures, yeast, bacteria, etc. The biological objects were placed at the end of the particle path. It is possible that the radiation effect of heavy ions on large biological objects can be modeled with collimated microbeams of high-energy electrons. [W.A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 2/2

ACC NR: AT6036522 SOURCE CODE: UR/0000/66/000/000/0100/0100

AUTHOR: Vikhrov, A. I.; Kolomenskiy, A. V.; Smirennyy, L. N.; Dudkin, V. Ye.; Kovalev, Yo. Ye.; Kuznetsov, V. G.

ORG: none

TITLE: Principles of calculating shielding from cosmic radiation [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966.]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 100

TOPIC TAGS: spacecraft shielding, radiation protection, solar flare, cosmic radiation biologic effect, radiation shielding

ABSTRACT: The problem of shielding the cosmonaut from high-energy corpuscular radiations is formulated in the following manner: for given conditions (trajectory, flight duration, etc.), the main shielding requirements must be determined (type and thickness of material, arrangement of shielding, etc.) in order to protect cosmonauts from irradiation in greater than permissible doses with minimum additional weight of the shielding. This article describes a paper in which: 1) Chief aspects of methods of calculating shielding were examined. 2) Mean tissue doses for monoenergetic

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Card 2/2

ACC NR: AT6036554 SOURCE CODE: UR/0000/66/000/000/0157/0158

AUTHOR: Dudkin, V. Ye.; Kovalev, Ye. Ye.; Kuznetsov, V. G.; Smirennyy, L. N.

ORG: none

TITLE: The spatial distribution of doses of high-energy protons absorbed behind shielding [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 157-158

TOPIC TAGS: radiation shielding, radiation dosimetry, solar flare, cosmic radiation biologic effect, radiation protection

ABSTRACT: Measurements were made of dose distributions by depth behind a shield in a plane-parallel phantom during irradiation with 126-, 250-, 415-, and 660-Mev protons from an OIYAI synchrocyclotron. Measurements of absorbed doses were made with a spherical tissue-equivalent ionization chamber 2 cm in diameter equipped with a recording device permitting measurement of currents to 10^{-13} amp. Depth dose distributions in the phantom were obtained with "narrow" and "wide" proton beams normally incident on shielding with a thickness up to 50 g/cm^2.

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KOVALEV, Yu.

Outstanding specialists. Avt.dor. 28 no.3[illegible] [illegible] 165. (MIRA 18:11)

KOVALEV, Yu., inzh.

Heating the bitumen pump of a motor road oiler. Avt.dor. 28 no.3:19 Mr '65. (MIRA 18:5)

YUDIN, P.N., inzh.; KOVALEV, Yu.A., inzh.

Drilling holes with flushing. Bezop.truda v prom. 5 no.6:25 Je '61. (MIRA 14:6)

1. Moskovskiy gornyy institut.
(Hydraulic mining)

KOVALEV, Yu.D.

Scientific technical conference on standardization in enterprises of the Moscow Province Economic Council. Standartizatsiia 26 no.6:59-60 Je '62. (MIRA 15:7)
(Moscow Province--Standardization)

KOVALEV, Yu.F.

Rare case of penetrating wound of the chest. Khirurgiia 35 no.10: 121-122 O '59. (MIRA 12:12)
(THORAX wounds and injuries)

KOVALEV, Yu.F. (Leningrad, 95, pr. Stachek, d.11, kv.45)

Diagnosis of closed injuries to the heart. Vest.khir. no.1:136-138 '62. (MIRA 15:1)

(HEART--WOUNDS AND INJURIES)

PRESMAN, T.S., inzh.; KOVALEVA, Yu.F., inzh.

Design of the frame and body of 2TE10L diesel locomotives.
Trudy VNIITI no.19:55-65 '64. (MIRA 18:3)

KOVALEV, Yu.G., inzh.

Using mazut for bitumen heating. Avt. dor. 28 no.4:26 Ap '65.
(MIRA 18:5)

KOVALEV, Yu.G.; MILOVIDOV, V.K.

New procedure for casting stator plates for turbodrills. Lit. proizv. no.4:42-44 Ap '62. (MIRA 15:4)
(Molding (Founding)) (Turbodrills)

KOVALEV, Yu.G., inzh.

Roads are a national concern. Avt. dor. 27 no.7:32 Jl '64.

KOVALEV, Yu.I., inzh.

Processes of the formation and realization of the forces of friction along the lateral surface of a separate foundation in sandy soil. Trudy TSNIIS no.56:99-104 '65.
(MIRA 18:5)

YAROSHENKO, V.A.; KOVALEV, Yu.I.

New trough developed by the Moscow Institute of Railroad Engineers. Osn., fund. i mekh. grun. 5 no.1:22-23 '63. (MIRA 16:5)
(Sand--Testing)

KOVALEV, Yu.I., inzh.

Formation and manifestation of friction forces along the lateral face of deep foundations in sandy soil. Trudy MIIT no.197: 143-154 '65.

Construction of small dynamometers. Ibid.:155-160 (MIRA 18:8)

YERMAKOV, D. A., Eng.; KOVALEV, YU. N., Eng.

Kashira Hydroelectric Power Station

Kashira electric power station is 30 years old. Eng.s D. A. Yermakov, Yu. N. Kovalev. Elek. sta. no. 7, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

S/020/61/137/002/012/020
B103/B215

158115 2209

AUTHORS: Odabashyan, G. V., Ponomarenko, V. A., Kovalev, Yu. N. and Petrov, A. D. Corresponding Member AS USSR

TITLE: Organo-silicon monomers with cyclobutyl rings containing fluorine

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 2, 1961, 338-340

TEXT: Following British and US papers on the synthesis of organosilicon monomers with cyclobutyl rings containing fluorine (Scheme A, at 210°C, for 24-36 hr),

$$CF_2=CFCl + CH_2=CHSiCl_3 \xrightarrow[24\ час.]{210^\circ} Cl_3SiCHCFClCF_2CH_2; \quad A.$$

$$CF_2=CF_2 + CH_2=CHSi(CH_3)Cl_2 \xrightarrow[30\ час.]{210^\circ} CH_3(Cl_2)SiCHCF_2CF_2CH_2 \text{ и т. д.}$$

the authors studied a new method of synthesis (Scheme B: (I), (II)).

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Organo-silicon monomers with...

$$CH_2=CH-CH=CH_2 + CF_2=CF_2 \rightarrow CH_2=CH\overline{CHCF_2CF_2CH_2}; \quad (I)$$

$$R_nCl_{3-n}SiH + CH_2=CH\overline{CHCF_2CF_2CH_2} \xrightarrow{H_2PtCl_6} R_nCl_{3-n}SiCH_2CH_2\overline{CHCF_2CF_2CH_2}; \quad (II)$$

$R = CH_3, C_2H_5, C_6H_5$; $n = 0, 1, 2, 3$.

They found that butadiene can easily be condensed by ethylene tetrafluoride (I). The yield of $CH_2=CH\overline{CHCF_2CH_2CH_2}$ was 90% (Ref. 5., D. D. Goffman, P. L. Barrik et al., J. Am. Chem. Soc. 71, 490 (1948)). From Table 1 it follows that high yields of the silicon hydrides used by the authors are added to vinyltetrafluorocyclobutane in the presence of chloroplatinic acid. The authors succeeded in adding dichlorosilane to two molecules of vinyltetrafluorocyclobutane under harder conditions (in the autoclave at 130°C and in the presence of the above acid. The corresponding monomer (no. 7) was obtained in a yield of 46%. It is noted that the polymers produced from the above monomers show valuable properties according to non-Soviet publications. There are 1 table and 5 non-Soviet-bloc references. The reference

Card 2/4

to English language publications reads as follows: J. D. Park, J. D. Groves, J. R. Lacher, J. Org Chem., 25, no. 9, 1628 (1960).

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy, Academy of Sciences USSR)

SUBMITTED: December 7, 1960

KOVALEV, Yu.N.; BARANOVSKIY, N.V., kand. tekhn. nauk

Studying the heat transmission of plate-type exchangers. Trakt. i sel'khozmash. no.7:39-41 Jl '65. (MIRA 18:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektrifikatsii sel'skogo khozyaystva, Moskva (for Kovalev). 2. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti (for Baranovskiy).

KAGAN, S.Z.; KOVALEV, Yu.N.

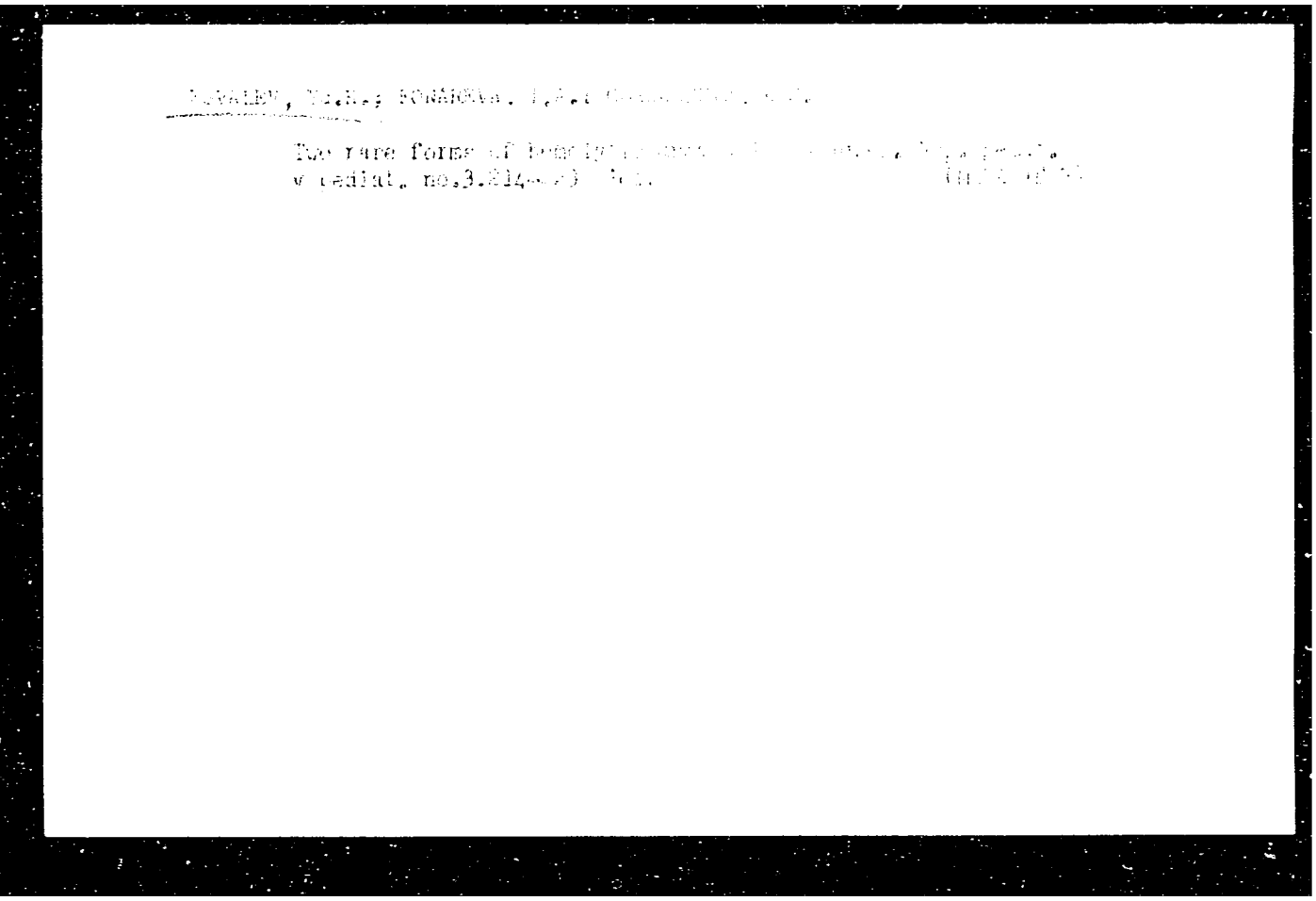
Using the liquid extraction method for the extraction of higher alcohols from their mixtures with hydrocarbons; review of literature. Trudy MKHTI no.40:122-127 '63.
(MIRA 18:12)

KAGAN, S.Z.; KOVALEV, Yu.N.; KAGAN, Yu.B.; ORLOVA, N.A.

Studying the extraction of higher alcohols from their mixtures with hydrocarbons. Trudy MKHTI no.40:128-133 '63.
(MIRA 18:12)

KOVALEV, Yu.P.; [illegible], N.I.; KOGAN, L.V.

Sedimentation test of the urine in some diseases of the blood [illegible] in children. Vop. gemat. i pediat. no.3:156-162 '64.
(MIRA 18:7)



KOVALEV, Yu.R.

Some clinical biochemical parallels in hemolytic states; review of foreign literature. Vop. gemat. i pediat. no.3:337-348 '64. (MIRA 18:7)

MEL'KUMOV, Lev Georgiyevich; BOGOPOL'SKIY, Beko Khaimovich; BERLOVSKIY, Vyacheslav Mikhaylovich; KOVALEV, Yuriy Sergeyevich; KOZIN, Yuriy Vladimirovich; NAYMAN, Artur Yefimovich; FEL'DMAN, Yelizar Samoylovich; SHUVAYEV, Anatoliy Andreyevich [deceased]; KORENDYAYEV, G.V., otv. red.; BELOV, V.S., red. izd-va; LOMILINA, L.N., tekhn. red.; IL'INSKAYA, G.M., tekhn. red.

[Automatic control of mine compressor stations] Avtomatizatsiia shakhtnykh kompressornykh stantsii. Moskva, Gosgortekhizdat, 1963. 151 p. (MIRA 16:8)
(Automatic control) (Air compressors)

BOGOPOL'SKIY, B.Kh.; KOVALEV, Yu.S.

Standardize the apparatus for automatifally controlling drainage units. Gor. zhur. no.3:75-76 Mr '63. (MIRA 16:4)

1. Gosudarstvennyy proyektno-konstruktorskiy institut avtomatizatsii rabot v ugol'noy promyshlennosti.

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S/080/63/036/001/005/026
D226/D307

11.4308

AUTHORS: Chernyayev, V.N., Povedskaya, L.G. and Kovalev, Yu. T.

TITLE: Rectification of metals

PERIODICAL: Zhurnal prikladnoy khimii, v. 36, no. 1, 1963, 56 - 62

TEXT: The rectification of Hg (at atm. pressure and under vacuum) and of Cd and Zn (vacuum only) was studied in an effort to develop a suitable apparatus for this purpose and to assess the possibilities of this method for the production of very pure metals. A transparent silica column of 18 bubbler-type plates was used for Hg. The apparatus is shown in Fig. 1. Both this, and a similar 10-plate column allowed successful rectification to be carried out; the collecting rates varied, e.g. from 3.7 to 28.0 g distilled Hg per minute. Regulation of the amount of reflux was difficult. Apparatus of basically the same construction was used for Cd and Zn, with a 10-plate column, with equally successful results. It is concluded

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Rectification of metals

that for columns up to 80 mm in dia, the plate separation, S, is sufficient when S = (3 + 5) h [sic] where h is the thickness of metal on each plate. Changes in the linear velocity of the vapor along the column are calculated and found to increase from 1.44 at plate 1 to 11.4 m/sec on plate 9. The velocity increased sharply from plate to plate, the increments becoming greater towards the top of the column. Bubbling on the plates is an essential though not the only condition for successful purification on columns of this type. There are 5 figures and 2 tables.

SUBMITTED: September 19, 1961

Fig. 1: Diagram of the apparatus for the rectification of mercury, with an 18-plate column and a device for the measurement of the amount of reflux.
Legend: 1 - container, 2 - thermometer housing, 3 - column, 4 - heating jacket, 5 - transformer, 6 - reflux measuring device, 7 - needle, 8 - dephlegmator, 9 - cooling jackets, 10 - trap, 11 - manometer, 12 - Tishchenko flask, 13 -

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Rectification of metals

vacuum pump, 14 - clip, 15 - receiver.
A - air
B - argon
C - point of detachment

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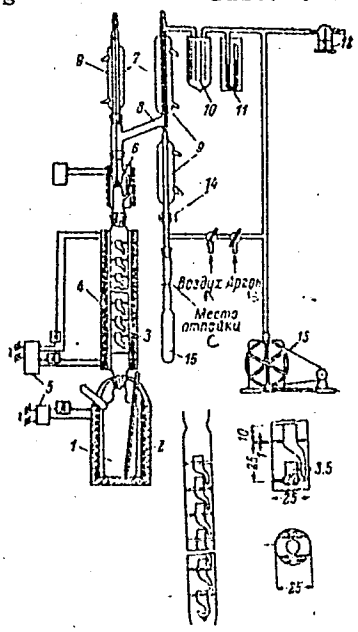
D226/D307

Rectification of metals



Card 4/4

S/125/62/000/001/001/011
D036/D113

AUTHORS: Slutskaya, T. M.; Kovalev, Yu. Ya.

TITLE: 17Kh3GMFA steel for products fabricated by electro-slag welding

PERIODICAL: Avtomaticheskaya svarka, no. 1, 1962, 1-6

TEXT: Information is given on a new steel grade, 17Х3ГМФА (17Kh3GMFA), suggested as a substitute for 25Х3НМ (25Kh3NM) steel used for columns of chemical apparatus working at up to 320 atm steam pressure at 150-300°C. Such columns are fabricated from 90-150 mm thick forged steel by electro-slag welding. The 25Kh3NM steel contains up to 2% nickel, and the required hardening with subsequent high tempering to sorbite is not possible at most Soviet plants. The 17Kh3GMFA steel is nickelfree, has a low copper content, and is easier to weld because of its low carbon content. The composition of 17Kh3GMFA is as follows (in %): 0.14-0.20 C, 0.17-0.37 Si, 1.5-1.8 Mn, 2.75-3.25 Cr, 0.40-0.60 Mo, 0.15-0.30 V, ≤ 0.30 Cu, ≤ 0.04 S, ≤ 0.04 P. Steel was melted in an electric furnace at the Zhdanovskiy metallurgicheskiy zavod (Zhdanov Metallurgical Plant), rolled, heat treated by over-

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17Kh3GMFA steel for products ...

heating to 1,300°C, etc, and rolled. Details of the heat treatment processes and the results of mechanical tests and metallographic investigations are given. Clear manganese banding and less expressed chromium banding was seen in metal overheated to 1,300°C prior to rolling, but prolonged holding at 470°C practically did not affect the carbide structure. The steel is recommended for service at not over 400°C. It was not tested for creep and long-term durability. Conclusions: (1) 17Kh3GMFA steel melted in electric furnace and rolled into 150 mm thick sheet is fully sufficient for steel used for chemical equipment. (2) The mechanical properties after normalization and tempering with postcooling in the furnace are as follows:

$\sigma_{T\,20°C} > 51$ kg/mm^2, $\sigma_{T\,300°C} > 44$ kg/mm^2, $\sigma_{B\,20°C} > 66$ kg/mm^2,

$\delta_5 > 20\%$, $\alpha_{k\,20°C} > 6$kG-m/cm^2. [Abstracter's note: The symbols are not defined]. (3) The mechanical properties of 17Kh3GMFA steel are unaffected by prolonged holding at 370-470°C, and the steel has no tendency to

17Kh3GMFA steel for products ...

hot brittleness. There are 2 figures, 3 tables and 11 references: 10 Soviet and 1 non-Soviet-bloc.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye. O. Patona AN USSR (Electric Welding Institute "Order of the Red Banner of Labor" im. Ye. O. Paton of the AS UkrSSR).

SUBMITTED: March 10, 1961

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S/125/62/000/002/005/010
D040/D113

AUTHORS: Slutskaya, T.M., Kovalev Yu.Ya.

TITLE: Electro-slag welding technology for 17GKh3MFA steel

PERIODICAL: Avtomaticheskaya svarka, no.2, 1962, 44-48

TEXT: Recommendations are given for electro-slag welding 150 mm thick 17ГХ3МФА (17GKh3MFA) steel sections for hot columns used in the chemical industry. Information on the 17GKh3MFA steel and requirements as to the base and weld metal of hot columns were given in a previous article by the authors (Ref.1: "Avtomaticheskaya svarka", No.1, 1962). The process stages are: (1) Assembling and electro-slag welding the elements of preliminarily annealed 17GKh3MFA steel; (2) Intermediate annealing of the welded column, and finally heat treatment as prescribed for the base metal. The chemical composition of the 17GKh3MFA steel and recommended Х5М (Kh5M) welding wire is (Table 1):

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Electro-slag welding ...

Metal	Content in %							
	C	Si	Mn	Cr	Mo	V	S	P
17GKh3MFA base metal	0.18	0.26	1.57	2.95	0.45	0.37	0.031	0.016
Kh5M electrode wire	0.15	0.10	0.48	4.20	0.58	-	0.03	0.027
Weld metal	0.14	0.28	1.01	3.94	0.49	0.16	0.014	0.016

Additional alloying of welds was achieved by increasing the portion of base metal in the welds. The following process details are recommended for 150 mm thick metal: 26-30 mm gap between edges; alternating current; 45-50 mm deep slag pool; AN-8 (AN-8) flux; two electrodes; 60-70 mm long dry electrode throat; welding wire feed of 220 m/hr (at 450-475 amp current); voltage of 48-50 v; 70 mm space between the electrodes; transverse motion of electrodes at 39 m/hr.

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D040/D113

Electro-slag welding ...

Welded specimens of 100 x 150 x 190 mm size were subjected to the following heat treatment: normalization with heating to 920±10°C, holding for 4 hrs and cooling at 100°/hr, tempering by heating to 700±10°C, holding for 4hrs and furnace cooling at 50°/hr. The cooling technique after normalization and high tempering corresponds to the recommendations of TsNIITmash. Conclusions: (1) The recommended technique (Kh5M wire, AN-8 flux, 50-55% of base metal in the weld metal) ensures sound welded joints without flaws. (2) The weld metal and the heat-affected metal at the welds in the as-welded state have an acicular troostite structure with a hardness of 380-400HV. Therefore, high tempering or annealing must be used directly after welding, before the metal cools down completely, and this must be done regardless of the final heat treatment. (3) After normalization and tempering, the strength, plasticity and toughness of the weld metal and heat-affected zone fully meet the technical requirements. (4) The weld metal has no tendency to hot embrittlement in long holding at up to 370°C. (5) Normalization and high tempering ensure a sufficiently uniform metal structure in welded joints, and this in combination with high Cr content in the weld and base metal seems to result in a high

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Electro-slag welding ...

resistance to hydrogen corrosion. Special specimens are presently under test for hydrogen corrosion. There are 4 figures, 3 tables and 6 Soviet references.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye.O.Patona AN USSR (Electric Welding Institute "Order of the Red Banner of Labor" im. Ye.O.Paton AS, UkrSSR)

SUBMITTED: April 19, 1961

Card 4/4

SLUTSKAYA, T.M.; KOVALEV, Yu.Ya.

Possibility of using in high pressure vessels joints made by electric slag welding without further normalizing. Avtom. svar. 16 no.11:31-39 N '63. (MIRA 17:1)

1. Institut elektrosvarki imeni Patona AN UkrSSR.

SLUTSKAYA, T.M.; KRIVENKO, L.F.; AVRAMENKO, V.A.; KOVALEV, Yu.Ya.

Electrode wire for the mechanized welding of carbon steel without a protective atmosphere. Avtom. svar. 16 no.8:13-25 Ag '63. (MIRA 16:8)

1. Institut elektrosvarki imeni Ye.O. Patona AN UkrSSR.
(Steel—Welding) (Electrodes)

BR

ACCESSION NR: AP4029255 S/0125/64/000/004/0027/0031

AUTHOR: Kovalev, Yu. Ya. (Engineer)

TITLE: Eliminating weld-affected-zone overheating in 20Kh3MVF- and 30GKh2MF-steel joints made by electroslag welding

SOURCE: Avtomaticheskaya svarka, no. 4, 1964, 27-31

TOPIC TAGS: welding, weld affected zone, electroslag welding, 20Kh3MVF steel, 30GKh2MF steel

ABSTRACT: The peculiarities of recrystallization were studied and a thermal treatment was developed for the purpose of restoring the properties of the weld-affected metal in electroslag welds. The weld-affected zone within 1.5–2 mm from the metal-fusion border in welds between 20Kh3MVF 240-mm-thick plate and 30GKh2MF 285-mm-thick plate was investigated. It was found that a single-time thermal treatment at 930C, i.e., higher by 40C than the critical point Ac_3,

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ACCESSION NR: AP4029255

did not produce any substantial change in the overheated zone of 20Kh3MVF. A double thermal treatment, at 930 and 980C, resulted in much better toughness in both steels; this treatment is recommended for electroslag-welded parts made from the above steels. Orig. art. has: 7 figures and 5 tables.

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona AN UkrSSR (Institute of Electric Welding, AN UkrSSR)

SUBMITTED: 18Jul63 DATE ACQ: 27Apr64 ENCL: 00

SUB CODE: MM NO REF SOV: 007 OTHER: 000

Card 2/2

KOVALEV, Yu.Ya.

Elimination of overheating of the weld-affected zone of 20Kh3MVF and 30GKh2MF steel joints made by electric slag welding. Avtom. svar. 17 no.4:27-31 Ap '64 (MIRA 18:1)

1. Institut elektrosvarki imeni Ye.O. Patona AN UkrSSR.

KHOKHLOV, S., KOVALEVA, A.

Agriculture

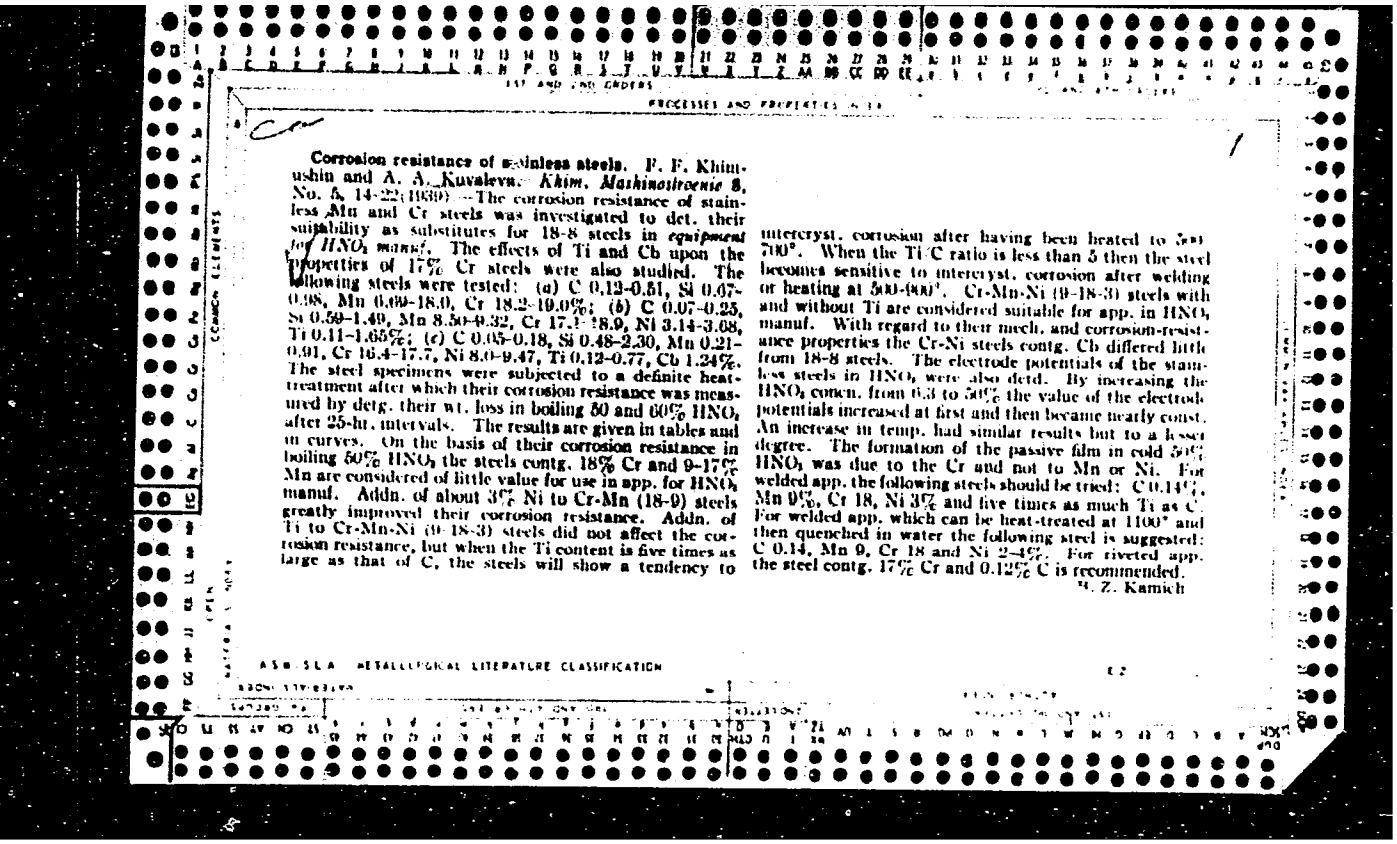
Trees and shrubs of the Lower Volga Valley. Saratov, Oblastnoe izd-vo, 1950.

9. Monthly List of Russian Accessions, Library of Congress, October 1953, Uncl.

KOVALEVA, A.A.; FEDYNSKIY, V.V.

Problems of oil and gas prospecting; Fifth All-Union Scientific and Technical Geophysical Conference. Geol. nefti. i gaza 8 no.3:51-55 Mr '64. (MIRA 17:6)

1. Gosudarstvennyy geologicheskiy komitet SSSR.



Corrosion resistance of stainless steels. F. F. Khimushin and A. A. Kuvaleva. *Khim. Mashinostroenie* 8, No. 5, 14-22 (1939).—The corrosion resistance of stainless Mn and Cr steels was investigated to det. their suitability as substitutes for 18-8 steels in *equipment for HNO_3 manuf.* The effects of Ti and Cb upon the properties of 17% Cr steels were also studied. The following steels were tested: (*a*) C 0.12-0.51, Si 0.07-0.98, Mn 0.69-18.0, Cr 18.2-19.0%; (*b*) C 0.07-0.25, Si 0.59-1.49, Mn 8.50-9.32, Cr 17.1-18.9, Ni 3.14-3.68, Ti 0.11-1.65%; (*c*) C 0.05-0.18, Si 0.48-2.30, Mn 0.21-0.91, Cr 16.4-17.7, Ni 8.0-9.47, Ti 0.12-0.77, Cb 1.24%. The steel specimens were subjected to a definite heat-treatment after which their corrosion resistance was measured by detg. their wt. loss in boiling 50 and 60% HNO_3 after 25-hr. intervals. The results are given in tables and in curves. On the basis of their corrosion resistance in boiling 50% HNO_3 the steels contg. 18% Cr and 9-17% Mn are considered of little value for use in app. for HNO_3 manuf. Addn. of about 3% Ni to Cr-Mn (18-9) steels greatly improved their corrosion resistance. Addn. of Ti to Cr-Mn-Ni (9-18-3) steels did not affect the corrosion resistance, but when the Ti content is five times as large as that of C, the steels will show a tendency to intercryst. corrosion after having been heated to 500-700°. When the Ti:C ratio is less than 5 then the steel becomes sensitive to intercryst. corrosion after welding or heating at 500-800°. Cr-Mn-Ni (9-18-3) steels with and without Ti are considered suitable for app. in HNO_3 manuf. With regard to their mech. and corrosion-resistance properties the Cr-Ni steels contg. Cb differed little from 18-8 steels. The electrode potentials of the stainless steels in HNO_3 were also detd. By increasing the HNO_3 concn. from 0.3 to 50% the value of the electrode potentials increased at first and then became nearly const. An increase in temp. had similar results but to a lesser degree. The formation of the passive film in cold 50% HNO_3 was due to the Cr and not to Mn or Ni. For welded app. the following steels should be tried: C 0.14%, Mn 9%, Cr 18, Ni 3% and five times as much Ti as C. For welded app. which can be heat-treated at 1100° and then quenched in water the following steel is suggested: C 0.14, Mn 9, Cr 18 and Ni 2-4%. For riveted app. the steel contg. 17% Cr and 0.12% C is recommended.

M. Z. Kamich

KOVALEVA, A.A. (Candidate of Vet Sci, Khar'kov)

"Methods of Cultivating Trichomones"

Report given at 13th Inter-VUZ (Higher Educational Insts.) Scientific-Industrial Conference, held February, 1956 at Kiev Vet Inst.

MAZING, L.A., SHUKHMAN, F.G., KOVALEVA, A.A.

Testing the "Kintzle" wire filter. Bum.prom. 35 no.8:22-23 Ag '60. (MIRA 13:8)

1. TSentral'nyy nauchno-issledovatel'skiy institut tsellyuloznoy i bumazhnoy promyshlennosti.
(Woodpulp) (Filters and filtration)

MAZING, L.A., kand.tekhn.nauk; GURICHEVA, Z.G., nauchnyy sotrudnik; YEVILEVICH, M.A., nauchnyy sotrudnik; LOMOVA, M.A., nauchnyy sotrudnik; KOVALEVA, A.A., nauchnyy sotrudnik

Methods of sewage purification. Bum.prom. 37 no.9:7-10 S '62. (MIRA 15:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tsellyulozno-bumazhnoy promyshlennosti.

(Sewage--Purification)

SEMENOV, G.S.; KOVALEVA, A.A.

Results of a conference on the direct radiometric and radiogeochemical methods for oil and gas prospecting. Sov.geol. 5 no.6:143-147 Je '62. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut yadernoy geofiziki i geokhimii.
(Radioactive prospecting--Congresses)

BERNSHTEYN, M.L., kand.tekhn.nauk; KOVALEVA, A.D., inzh.

Change in the structure of cold-worked 1Kh18N9T and Kh25T steels under the effect of heating. Metalloved. i term. obr. met. no.8: 25-30 Ag '60. (MIRA 13:9)

1. Moskovskiy institut stali.
(Steel, Stainless--Metallography)
(Metals, Effect of temperature on)

KOVALEVA, A.D.

18.7100
18.1130

81879

S/129/60/000/08/006/009
E073/E135

AUTHORS: Bernshteyn, M.L. (Candidate of Technical Sciences) and Kovaleva, A.D. (Engineer)

TITLE: Changes in the Structure of the Cold Worked Steels 1Kh18N9T and Kh25T during Heating

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No 8, pp 25-30 (+ 1 plate)

ABSTRACT: The steels referred to are used extensively due to their resistance to the effect of acids, scale resistance and also heat resistance. During the process of manufacture of cold rolled or drawn tubes made of austenitic and ferritic steels, difficulties arise which are due to changes in the structure and properties of the metal and which are not always fully explained. For elucidating the nature of some of these changes, investigations were carried out which are described in this paper. The chemical compositions of the investigated steels were as follows:
Steel Kh25T: 0.15% C; 0.9% Si; 0.77% Mn; 26.7% Cr; 0.4% Ni; 0.73% Ti.
Steel 1Kh18N9T: 0.11% C; 0.62% Si; 0.17% Mn; 17% Cr; 8.7% Ni; 0.64% Ti.

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81879

S/129/60/000/08/006/009
E073/E135

Changes in the Structure of Cold Worked Steels 1Kh18N9T and Kh25T during Heating

Prior to cold rolling and cold drawing the blanks were pierced and rolled in hot rolling stands and subjected to preliminary tests. After hot rolling the tubes were quenched in water from 1100 and 950 °C respectively. Following that, the tubes were cold rolled or cold drawn with maximum degrees of deformation so as to obtain clearly pronounced textures. The reductions were 75% for the steel 1Kh18N9T and 95% for the steel Kh25T. From the tubes 20 x 20 mm specimens were cut which were heated to 400, 500, 600, 700 and 800 °C and held at each temperature for durations of 1, 5, 25, 50 and 100 hours. The structural transformations were studied by hardness measurements, microstructure study with an optical microscope, static metallography and X-ray structural analysis. The results of the changes in hardness and stretching of the grains in cold drawn and cold rolled tubes from the two steels are entered in Figs 1 and 2, and 3 and 4, respectively. The results show that quenched and cold worked austenite of the steel 1Kh18N9T is more inclined to develop phase transformations leading to an increase in hardness than annealed and cold deformed austenite which is characterised by a greater stability.

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Changes in the Structure of Cold Worked Steels 1Kh18N9T and Kh25T during Heating

Although the general relations remain the same, comparison of the graphs in Figs 3, 4 with those in Figs 1, 2, lead to the conclusion that in the steel Kh25T the transformations are considerably slower than in the steel 1Kh18N9T. It is possible that this is due not only to the differing nature of the forming phases, but also to a generally lower level of type II distortions in the ferritic steel than in the more strongly work-hardened austenitic steel. The experimentally established martensitic transformation in the steel 1Kh18N9T and the formation of a σ phase in the steel Kh25T during repeated heating of cold worked specimens lead to a further conclusion relating to the influence of the accumulated deformation energy on the distribution of the individual elements in the solid solution. The determined transformations in both these steels could not occur in the equilibrium state. Such occurrence is made possible in the temperature range 400-600 °C by a redistribution of the elements which leads to a lowering of the solid solution and formation of

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Changes in the Structure of Cold Worked Steels 1Kh18N9T and Kh25T during Heating

islands which are poor in nickel. Apparently such lowering leads in many cases to the formation of thermodynamically more stable alloys.
There are 5 figures.

ASSOCIATION: Moskovskiy institut stali
(Moscow Steel Institute)

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IX

VOLKOVITSKIY, G.I., dotsent, kand. tekhn. nauk; PISHCHIKOV, G.P., inzh.; YUFEROV, V.M., dotsent, kand. tekhn. nauk; DZYUBA, M.I., inzh.; SAY, N.F., inzh.; Prinimali uchastiye: SURZHIKOV, V.A., inzh.; KOVALEVA, A.D., inzh.; TKACHENKO, A.V., inzh.; KIRVALIDZE, N.S., inzh.; GLADKIKH, D.V., inzh.; YESAULOV, A.T., inzh.

Characteristics of producing large-diameter pipe of Kh18N12M2T steel. Stal' 22 no.6:532-535 Je '62. (MIRA 16:7)

1. Yuzhnotrudnyy zavod (for Surzhikov, Kovaleva, Tkachenko, Kirvalidze, Gladkikh, Yesaulov).
(Pipe, Steel) (Rolling(Metalwork))